



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

October 26, 1994

In Reply
Refer To: HW-113

Mr. Robert L. Geddes
Senior Environmental Engineer
Monsanto Chemical Company
P.O. Box 816
Soda Springs, ID 83276


Dear Mr. Geddes:

Enclosed are comments on and/or approvals of various interim RI/FS deliverables which we have discussed previously but which have never before been formally transmitted to Monsanto. The documents in question are the Air Dispersion Modelling Memorandum, the Groundwater Fate and Transport Modelling Memorandum, the Groundwater Quality Memorandum, and the Revised Soil and Sediment Investigation Memorandum.

Subject to the enclosed comments, which were previously discussed with Monsanto, the subject documents are approved for use in the Remedial Investigation Report. Please review the enclosures and provide a written response to the comments on or before November 18, 1994. Wherever possible, comments should be addressed in the preparation of the Remedial Investigation Report rather than separate deliverables.

If you would like to meet again or have a conference call to discuss these comments before responding please do not hesitate to call me at 206-553-2100.

Sincerely,


Timothy H. Brincefield
Superfund Project Manager

Enclosures

cc: David Banton, Golder Associates
Andrew Hafferty, Ecology and Environment
Gordon Brown, IDHW

AR 2.1



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**Monsanto Soda Springs Site Phase II Remedial Investigation
Air Dispersion Modelling Memorandum
Comments**

Overall, the document produced by SENES Consultants Ltd., for Monsanto, provided the information necessary to assess emissions, dispersion, and deposition of chemicals and particulates from sources at the site. The Task 2 objectives of the Phase II Work Plan appear to have been met, provided the concerns noted are addressed.

1. The Report fails to provide some information which is routinely included in a modelling report. For completeness, information related to model options used and receptor grid spacing should be provided. The "building" dimensions used to evaluate the impacts from the slag pouring psuedo-stacks should also be provided.
2. The report should provide a figure (or figures) which indicate the locations and dimensions of all sources evaluated in the modelling analysis. Such figures would prove to be very useful in interpreting the modeling results.
3. **Section 2.0 - Meteorological Data**
Mixing heights used were from Salt Lake City. However, Section 2.2.1 of the Phase I RI/FS prepared by Golder Associates, April 23, 1992, states that the Boise mixing heights are more representative of the area. The reason for using Boise rather than Salt Lake City data should be provided.
4. **Section 2.3 - Temperature**
 - a. The text states that -33.9 C is the "lowest mean daily temperature", the "lowest temperature", and the "mean daily minimum temperature" occurring in December, 1990. Which one is correct?
 - b. Should "Mean annual average" be "mean monthly average"?
 - c. According to Tables 2.3 and 2.4, Jan 1990 average temp is not lower than Jan 1991 as stated in last line of the text. Is the text incorrect or is there some other explanation?
5. **Section 2.4 - Mixing Heights**
January 1991 mixing heights appear to be incorrect - afternoon mixing height should be greater than morning mixing height. Revised mixing heights or an explanation should be provided.
6. **Section 4.0**
 - a. Sections 4.3.4 and 4.3.8 discuss apparent discrepancies in the manganese and molybdenum emissions data from the kiln venturi scrubbers that affect the calculated ambient concentrations. This data is presented in Tables A.1 - A.4. A reference is needed for the source of this data to verify or correct the

anomalous values found in emissions of manganese and molybdenum from the kiln venturi scrubbers.

- b. The emission rates reported in these tables are different than those found in Table 5.1 of the Phase I RI/FS report. Explain which emission rates are considered most representative and modify the text accordingly.

7. Figure 2.1

The figure would be improved if the authors would break down wind direction sectors into wind speed classes. For example, percent of wind from each direction in 0-2, 2-5, 5-10 m/s ranges.

Appendix A

8. Section A.2.1.1 and Table A.1. Were the stack sampling analyses of the Kiln Venturies for fluorides in 1988 based on soluble or total? If sampling occurred for hydrogen fluoride it likely resulted in a soluble fraction. If emissions estimates from one source are based on soluble fractions, and other sources based on total fractions, then total emissions and mass balance may be underestimated. Is this the case in this situation?
9. Section A.2.1.3. A description of the method of estimating NCSS particulate emissions at 28 lb/hr should be provided.
10. Section A.2.1.4. and Table A.3. Is the fluoride emission factor of 2 mg/scf (from a 1976 memorandum), as reported in the May 1993 Air Emissions Inventory based on soluble or total fluoride analyses? If emissions are based on soluble, then reconciliation with total fluorides from other sources should be examined.
11. Section A.2.4. The paragraph should also list Tables A.7.1 and A.7.2.
12. Section A.2.3.1, Section A.2.3.2, Table A.6.1 and Table A.6.2.
 - a. The new emission rates for furnace building fugitives and slag pouring operations should result in higher fluoride emission rates in Tables A.6.1 and A.6.2 when compared to the previous emission estimates.
 - b. In addition, why are the trace metals and radionuclides based on treater dust concentrations while the fluoride concentrations are not? Is this a partial explanation for the 18 percent mass balance difference as stated on page A.9?
 - c. Reference is made to Section 3.3.5 for calculations, but no Section 3.3.5 is contained in this report. What is the correct reference?
13. Tables A.11.1 and A.11.3. Emission values for Kiln Venturis, Slag Pouring (Hot), and other sources are the same for 1990 and 1991, however other emission rates such as for THFCs change. The reason for this is unclear and should be provided.

14. Table A.11.3 The kiln venturi PM10 value appears to be wrong, possibly a typographical error. Is this the case or is there another explanation?

Appendix D.

15. There appears to be a few anomalous levels of fluoride in the sampling results. Concentration differences up to 2 orders of magnitude are reported for Quartzite Pile #2, Coke Pile #1, and the ferrophosphorus slag. A copy of the associated QA/QC report and any data qualifiers for the fluoride samples in the source piles should be made available to EPA.

Monsanto Soda Springs Site Phase II Remedial Investigation Groundwater Fate and Transport Modeling Memorandum Comments

The document is adequate and approved for incorporation in the RI, subject to satisfactory resolution of the following comments in a response to this letter and the RI:

General Comments

1. The original scope of work as defined in the Revised Hydrogeologic Investigations memorandum specified the use of a model scheme presented in Bear (1979). This model was apparently not used. Describe how the Domenico 1987 transport solution works, why it was chosen, its assumptions, and how it was modified.
2. The modeling should include a determination of the relative sensitivity of the parameters used as input. Explain whether this was done, and if not, why not. If it was done, provide the results.
3. Discuss how the proposed background concentrations were used in the transport modeling, given that many of the compounds are asymptotic to zero concentration.
4. Provide a discussion of how the Flowpath model simulates the withdrawal of wells, given the large grid size. Comment on whether the model uses the grid size as the effective well radius, and what effect this has on the modeled drawdown.
5. Provide an explanation of the differences in the plume centerline as shown on Figures 3-6 and 4-1. The text should also provide a comparison of the lengths of the different flow paths used in the transport model, and the locations of the three reference points on Figure 4.1 used in the transport modeling.

Specific Comments

6. Page 11, third paragraph. Explain why porosity is included in the model input if it has no effect on the solution of the flow equation. Also comment on how the rate of water influx (q) is determined in the mass balance derivation of the flow equation.
7. Page 13, first. Explain what is meant by "reduced extent" of the shallow aquifer.
8. Page 17, equation 5. A reference for the equation should be provided.
9. Page 19, second paragraph. Explain why a porosity of .25 was used, instead of .3 as selected from flow model.
10. Figure 3-7. It would be helpful if this figure used the same scale as the calibrated model Figure 3-4 for ease of comparison.

**Monsanto Soda Springs Site Phase II Remedial Investigation
Groundwater Quality Memorandum
Comments**

In general, the document provides an adequate description of groundwater quality based on existing site data and the information should be included in the RI. However, this memorandum and previous hydrogeological memoranda submitted by Monsanto do not, or only vaguely, interpret water quality or hydrogeologic relationships of any springs, particularly the Mormon Springs area. The upcoming remedial investigation (RI) report should discuss the nature and extent of spring contamination, and provide interpretations of hydrogeological connections. This may also assist in describing the levels of certain constituents in the Mormon Springs and Soda Creek sediment samples.

1. The statement in Section 3.1, that the cadmium is restricted to the site does not appear to be supported by the detection of cadmium in the samples from Mormon A spring (0.015J mg/l, Figure 9, and Figure 35). The concentrations of cadmium in Mormon A have remained fairly stable over the past 4 sampling rounds. Monsanto should comment on the significance of this data relative to the aforementioned conclusion.
2. Despite the general decreasing trend in the concentrations of cadmium, chloride, fluoride, and selenium over approximately 10 years; these chemicals have either increased or remained fairly stable in wells 22, 36, calf spring, and Mormon spring over the RI sampling period. Monsanto should provide additional discussion in the RI by integrating the results of the previous memoranda for a more complete interpretation.
3. The significance of the discussion that certain contaminants of concern have declining concentrations from the regression analysis of the time history plots is not made clear. All other factors being equal, the concentration in time at a fixed measuring point, such as a well, would be expected to decline after the peak of a plume has migrated past its location. This does not necessarily imply that the contaminants themselves are gone from the ground water, but have simply been transported to another location, or are being affected by some physio-chemical process in the aquifer. The RI should provide a comprehensive picture of the declining trends by integrating the time history plots with information contained in the other hydrogeological memoranda.
4. There is insufficient discussion of the regression analysis procedure. The regression procedure should be in the text rather than in table footnotes. Monsanto should state why this specific regression model was chosen over others. It would also be useful for the regression analysis to omit the data collected prior to corrective actions at the source areas, thereby providing more sensitivity to the analysis for the period thereafter. The regression analysis also would benefit from a more rigorous application of statistical analysis, such as plotting the 95% confidence interval about

the regression lines. Monsanto should explain why only those constituents that had a declining trend were fitted with a regression curve.

5. Monsanto should provide a discussion of selenium concentrations in groundwater, rather than de-emphasizing it because of past analytical problems. Selenium levels exceed drinking water standards, resulting in Monsanto's action to provide municipal water service for the Humbolt residence in lieu of using the Lewis well water for human consumption.
6. In Section 5 of the memorandum, some qualitative statements as to potential water quality changes in the northwest pond/hydroclarifer plume would be useful.

**Monsanto Soda Springs Site Phase II Remedial Investigation
Revised Sediment and Soil Investigation Memorandum
Comments**

The data provided in this memorandum is approved for use in the Draft RI report, subject to resolution of the following comments.

General Comments:

1. Approval of this data and report for use in the RI does not constitute agreement by EPA that the extent of contamination has been fully defined. Subject to the resolution of the rest of these comments, EPA's approval indicates agreement that the extent of areas which exceed the screening criteria used in this report have been defined, except to the East. EPA does not necessarily agree with the report's conclusion that sample is anomalous. No additional sampling, except that which is currently being planned for Soda Creek and the Alexander Reservoir, appears necessary at this time, however, it will be necessary for EPA to review the complete draft RI report before reaching any conclusions on the extent of contamination or the need for additional sampling to complete the RI/FS.
2. EPA continues to disagree with Monsanto's interpretation of the utility of the UTL approach to evaluate data sets with as few as 3 samples, such as was used for the background sediment sample comparisons. For this site, EPA has specifically informed Monsanto that UTL statistics based on data sets with only 3 samples are inappropriate (EPA letter to Monsanto dated 6/24/93). If Monsanto wishes to employ the UTL approach in the RI/FS, additional samples must be collected.
2. The revised memorandum compares the sample data only to background and human health risk-based screening levels. Few interpretations regarding the nature and extent of potential contamination were provided in this memorandum relative to previously submitted technical memoranda. In general, the physical and ecological characteristics of the soils and sediments were not discussed. The RI Report must provide a more comprehensive characterization of the soils and sediments.

Specific Comments:

3. page 4, paragraph 2: The selection of the 0-1" background data is based on EPA's desire to be consistent with likely human exposure, rather than a specific zone of impact. The text should be revised and the RI should be written accordingly.
4. Page 4, paragraph 4. The adequacy of selenium characterization needs to be discussed in the text. All selenium sediment data, including that from Mormon Creek

must be included and discussed in the RI. If there are quality concerns, those should be addressed in the text as well.

5. Page 5, paragraph 1. Monsanto states that the trend is for sediment constituent concentrations is to increase to a maximum that is generally greater than 1,000 feet downstream of the outfall, except for nickel. There appear to be other exceptions to the trend, however: cadmium, polonium-210, and vanadium also exhibit maximum concentrations within 300 feet of the outfall. Monsanto must provide a revised discussion of sediment concentration trends in the RI and discuss whether additional sampling is necessary to complete site characterization.
6. Page 6, paragraph 1. The risk-based concentrations used in Table 3 contain some outdated values. A revised Table 3 with up-to-date information should be prepared, provided to EPA, and used in the RI.
7. Page 6, paragraph 1. Monsanto should provide the rationale for using the 95% coverage and 95% confidence (95/95) when calculating their UTL, including all assumptions and sensitivities of the method. EPA has used the 90% coverage and 95% confidence (90/95) UTL in the risk assessment. This selection was based largely on a study performed by the Washington Department of Ecology, which compared various combinations of confidence and coverage to find a combination which minimized Type 1 and Type 2 statistical errors.
8. Page 6, paragraph 2. A lognormal distribution was assumed, not used in this case. For this site, EPA agrees that a lognormal distribution is often a better assumption than a normal distribution for most of these background chemical concentrations. Monsanto should state whether a fit test was conducted to determine if the background data indeed fit the assumed distribution. This assumption of distribution may be important in the numerical outcome of the UTL approach. As stated in the previous comment, Monsanto must provide the specific UTL assumptions and sensitivities used in this memorandum when the data is presented.
9. Page 6, last sentence. Additional information must be provided which discusses the adequacy of the selenium and fluoride characterization in the soils, since the analytical procedures for selenium in groundwater were corrected, but those for the soils media, source piles, Phase I Soda Creek samples, and the Phase 1 effluent line water samples were not.
10. Page 7: Based on the revised figures provided by Golder with the letter dated Dec. 22, 1993 and additional sampling information dated January 17, 1994, questions have arisen about the conclusion on page 7 that "the soil screening analysis indicates the extent of soil exceeding the screening criteria is bounded in every direction except possibly to the east". Is that statement accurate given the complete data set?

11. Table 4, 12/23/93: This table is supposed to list all Phase II sampling locations and identify which constituents exceeded either the UTL or Risk-based concentrations. The Table as provided does not appear to be complete. A revised Table 4 which does list all sampling locations and which constituents exceeded either screening criterion must be provided to EPA and included in the RI. To further clarify this issue, the revised Table 4 should also include a third column, which identifies the constituents at each location which exceed both criteria. An explanation should be provided for any sampling locations which are not included (Several sampling locations, such as MS2-15, 17, 31, and 32, appeared to be missing from this Table).

12. Figure 5 must be updated to include all data and be provided to EPA and in the RI.

13. Table A-1. Several data points are missing from this table. According to the previous revision dated August 4, 1993, the following concentrations (in mg/kg or pCi/g) should be added to the MSSS-100 list:

(a)	Copper	42.4
(b)	Nickel	93.9
(c)	Selenium	347
(d)	Polonium-210	1.3

Since the concentrations of several chemicals in the Mormon Spring sediment sample are higher than any Soda Creek sediment sample (especially selenium), possible explanations for the occurrence should be provided in the RI.

14. Table B-3.

- a. The MCS-C1 field duplicate soil sample should not be used in the calculation of UTLs. The purpose of the duplicate is quality control of other data points.
- b. The "log" column should more properly be labeled "ln" (natural log). The UTL concentrations should be placed in the "mg/kg" or "pCi/g" column, rather than in the "log" column. As presented, it is not clear whether the UTL values represent UTL or log(UTL).
- c. The fluoride data point from BACK-3 was omitted from the UTL calculations. EPA considers this an outlier and has not used it in the risk assessment; however, Monsanto should provide an explanation for this data omission.
- d. Monsanto should provide an explicit description of the UTL equation in a footnote because some of the results could not be duplicated.

15. Tables should be revised to include definitions for the common QA codes used (U, J, R, etc.), where appropriate.